The Impaired Driver

A Critical Review of the Facts

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• **Traffic accidents have been subject to relatively little scientific study in California. A substantial barrier to adequate basic research in this field has been the assumption that more is known about the underlying causes of accidents than actually is. For example, within the medical profession, there is a tendency to assume that physical impairments of drivers are important in the causation of accidents, although little evidence has been collected to confirm or deny this assumption.**

Research into the underlying causes of accidents is a worthy but infinitely complex task. It must be accomplished before the driver's contribution to accidents can be seen in proper perspective, its components identified and dealt with on a rational basis.

FROM A SCIENTIFIC STANDPOINT the "impaired" driver is a nebulous entity indeed. Presumably he is impaired for driving, but where are the specifications for various driving tasks against which to match the driver's capabilities? Where are study results to tell how to detect and measure those impairments which are significant in the causation of traffic accidents? Where does impairment in the driver end and impairment of the automobile and roadway begin? Are there ordinary driving tasks for which any driver might be impaired at some time? Why do we assume that impairment of the driver is the cause of most accidents when scientific study of the underlying causes of traffic accidents has barely begun?

Although meticulous scientific investigations of commercial passenger aircraft accidents are carried out as a matter of course, no such investigations of traffic accidents are conducted. For each death in an aircraft accident $498,400 is spent on safety research; for each traffic death, only $2.38.[22] Perhaps careful evaluation of commercial passenger air accidents is one reason that, in 1961, it was about six times safer to fly by scheduled airline than to travel the same distance by private automobile.[17] Only in the last few years has this kind of basic research into the underlying causes of traffic accidents been attempted.[14,18] The dearth of factual data available about the causes of traffic accidents and the contribution of the driver must be more widely recognized. A major barrier toward making more rapid progress in the control of traffic accidents has been the tendency to assume that we have this knowledge. All kinds of "shot-gun" therapy have been suggested and actually directed at the "impaired" driver without an adequate diagnosis of what constitutes significant impairments to driving.

IMPAIRMENTS

Based on the present state of knowledge, what can be said about driver impairments?

1. There are gross physical defects which obviously are not compatible with safe driving—blindness is the most obvious. These conditions are not commonly encountered in drivers.

2. There are conditions, often not obvious and frequently temporary, which can be just as incompatible with safe driving—taking alcohol or certain kinds of medicine, for example. These conditions are probably quite common.

3. There may be impairments of real significance which we have not yet identified.

4. A driver may have a variety of lesser impairments which do not interfere with safe driving and may have little or nothing to do with any accident he has. There may even be defects or conditions which are an advantage to driving or that stimulate a driver to become more skillful than he would have been otherwise.

5. The "impaired" pedestrian should not be overlooked. In a sense he is the other "driver" in a collision between him and the vehicle. Pedestrians comprise about 20 per cent of the fatally injured traffic victims in California.

6. There are two categories of drivers for which significant documented information is beginning to emerge—drivers intoxicated by alcohol, and youthful male drivers.

The young men drivers under 25, as a group, have the poorest driving record as measured by accidents and citations.[8,9] In scientific circles, there is criticism about condemning any group of drivers

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TABLE 1.—*Estimated Resident Population and Estimated Drivers with Valid Licenses by Age and Sex, California, 1960*

Age Group	Estimated Resident Population (In Thousands)			Estimated Number of Drivers (In Thousands)			Drivers as Per Cent of Population		
	Both Sexes	Men	Women	Both Sexes	Men	Women	Both Sexes	Men	Women
All ages	15,831	7,848	7,983	7,952	4,885	3,067	.....	.....	.....
15 and over	11,079	5,423	5,656	7,950	4,883	3,067	71.8	90.0	54.2
Under 15	4,752	2,425	2,327	2	2	.....	.....*	0.1	.....
15-24	2,368	1,227	1,141	1,155	711	444	48.8	57.9	38.9
25-34	2,256	1,117	1,139	1,950	1,150†	800	86.4	99.0†	70.2
35-44	2,238	1,105	1,133	1,976	1,163†	813	88.3	99.0†	71.8
45-54	1,736	856	880	1,447	894†	553	83.4	99.0†	62.8
55-64	1,231	580	651	889	584†	305	72.2	99.0†	46.8
65 and over	1,250	538	712	533	381	152	42.6	70.8	21.3

*Less than 0.1 per cent.

†Because of duplication of operators and chauffeurs licenses, sampling errors, and the fact that some holders of valid licenses may have left the State, this figure may be too high.

Source: State of California, Department of Finance, population estimates prepared July, 1959. State of California, Department of Motor Vehicles, *Driver Record Study, 1958,* and communication giving number of outstanding valid licenses, 1960.

without better data on the quantity of their driving. Maybe the accident and citation experience of the young male driver can be explained by his driving more than others. Only if all drivers did the same kind, and the same number of miles of driving, and at the same hours, would they approach similarity in risk of accidents and citations. In its study of negligent operators,[8] the California State Department of Motor Vehicles found that 96.5 per cent of such operators were men; and compared with other drivers they were much younger, drove much more, and included a disproportionate number of commercial drivers. However, the annual mileage of negligent operators under 25 was lower than that of other age groups of negligent operators, but still some 500 to 600 miles per year more than for the average male driver not classified as negligent.

This partial evidence of some increased risk can account only for a small proportion of the poor experience of the young driver. This group offers a fertile field for research into the causation of their accidents. We already know that whatever the significant factors are in the causation of accidents in this group, they do not persist, to the same degree at least, as these drivers (who survive) become older. Another fact is well established. This group of men, 15 to 25 years old, have a lower rate of physical impairments or disabling conditions than other men.[20] In other words, the group of men in best shape physically have the poorest driving experience, and the leading cause of death and injury among them is traffic accidents.

Most expert opinion holds that the intoxicated driver and the intoxicated pedestrian make a sizable contribution to traffic accidents. The research which comes nearest to a scientific confirmation of this opinion comes from New York.[12,13,16] The New York studies revealed a high proportion of significant blood alcohol levels among dead drivers responsible for their accidents—much higher than was ever suspected (of the 73 per cent who had been drinking, 46 per cent had blood alcohol levels of over 250 mg per 100 cc, compared with uninvolved drivers (controls) of whom 26 per cent had been drinking and none had blood alcohol more than 250 mg per 100 cc[16]). Certainly there is a great need for study and documentation of the extent and characteristics of the drinking driver and drinking pedestrian problem in California. This task is technically difficult and expensive, even in a state like New York which has an "implied consent" law.* As California does not have (although it needs) such a law, the legal barrier to obtaining the necessary data and proper controls is formidable. Only for persons who die of traffic accidents can descriptive data about alcoholic intoxication be collected, and then only where the coroner is willing and has facilities to have alcohol tests performed.

It is interesting to note that the same two factors, age and alcohol, are emerging as significant impairments of both drivers and pedestrians. However, the age factor for adult pedestrians is on the other end of the spectrum—*old* age rather than youth.[13]

DRIVERS

What can be said about the general characteristics of California's vehicle operators? In California, there are more than eight million drivers; about 61 per cent of them are men. About 72 per cent of the driving-age population have valid operators' licenses. Of men between 25 and 64, about 99 per cent have valid operators' licenses (Table 1). Men drive almost twice the annual mileage that women

*An "implied consent" law stipulates that a person operating a motor vehicle upon the public highways consents to tests to determine the alcohol content of his blood or breath whenever a law enforcement officer has good reason to request it. In California drivers may refuse such tests, thereby evading the best scientific evidence to establish the facts when the charge is driving while in an intoxicated condition.

drivers do, according to one sampling survey of California drivers.[8] It can be estimated roughly that men account for three-fourths of the miles of driving in California, and women only one-fourth. It is suspected, but not confirmed, that the mileage driven by women may not be equivalent and is probably less, in risk, than is the mileage driven by men. It rarely includes long hours of commercial driving, for example. However, assuming that the risk per mile is equivalent, women drivers would have to be responsible for over one-fourth of the accidents and citations before it could be said that they are not as safe drivers as men. In one California study, women accounted for about one-fifth of the accidents and about one-sixth of the citations.[9] These data come close to answering the age-old question about the relative safety of men and women drivers. If the risk per mile for men is greater, then women are about equally safe drivers. If the risk per mile is equal, then women are safer drivers.

HEALTH STATUS

What can be said about the health status of California drivers? A number of studies and reports can be cited[5,6,7,10,11,15,21] on which to base estimates of various physical, social, and mental conditions existing among California's driving age population (over 15 years). Some examples are listed in Table 2. It is not known to what degree, if any, these conditions in drivers contribute to accidents.

A highly controversial subject is whether or not a medical examination should be carried out as a condition of issuing a driver's license. This procedure is in effect in Pennsylvania. The rejection rate for Pennsylvania drivers averages 14 for each 10,000 medical examinations, with the rate for the older drivers being about ten times that of the younger ones. If one includes the several hundred Pennsylvania applicants who probably refused examination because they feared rejection, the rate could go only to a maximum of 19 rejects per 10,000 applicants.[19] Pennsylvania may have a higher rejection rate than California would have, for in Pennsylvania renewal of drivers' licenses by mail had been allowed. In California, drivers are subject to scrutiny in person by the staff of the Department of Motor Vehicles each time a driver's license is renewed. Probably this practice has already kept many who have obvious deficiencies from making application. Nevertheless, if Pennsylvania's experience were applied to California, there would be about 11,000 rejected among the over eight million drivers. In California, in 1960, there were some 77,000 drivers killed or injured in traffic and about 240,000 drivers of sufficiently poor experience to be classified as negligent. With about 300,000 drivers in trouble, one can see that the ordinary physical examination, which would select out only 11,000 drivers, is not a very efficient or sensitive test for detecting the kind of driving impairments which contribute significantly to accidents. Either medical problems are not a major contributor or there are significant medical impairments not subject to detection during routine physical examination. There is no doubt that the driver with physical impairments detectable on medical examination and which obviously impair driving should not be licensed; however, there must be easier and less expensive methods of reaching one of them than by carrying out over 700 physical examinations. Medical examinations for all California driver license applicants, new and renewal, would call for about 12,000 to 15,000 examinations every work day, or about two a day for each physician in general practice.[4]

There may be very good reasons for subjecting the adult population to regular medical examinations

TABLE 2.—*Estimates of Incidence (in Californians of Driving Age) of Physical, Social and Mental Conditions that Might Contribute to Automobile Accidents*

1,700,000	*Physical disabilities** (includes hearing, vision, orthopedic and speech impairments).[21]
	Includes:
420,000	impaired hearing (2/5 over 65 years)[21]
7,000	totally deaf[21]
210,000	impaired vision[21]
24,000	totally blind[11] (most are over 65 years)
410,000	orthopedic handicaps (limbs, trunk, or back impaired)[21]
22,000	absence of major extremities[21]
700,000	*Estimated number of problem drinkers.* Five out of eight are men. (100,000 of these are advanced alcoholics with serious physical complications.)[10]
160,000	*Estimated number with history of admission to a State mental hospital* for mental illness during past ten years including resident population of State mental hospitals.[7]
100,000	*Estimated number of mentally defective* (10 per cent are in State hospitals; remainder mostly in general population).[7]
100,000	*Estimated number with known heart disease* (½ in persons over 65 years; 60 per cent in men).[11]
80,000	*Estimated number of known diabetics* (60 per cent women).[11]
40,000	*Estimated minimum number with epilepsy.*[15]
20,000	*Estimated number of persons discharged from State prisons* during last four years or now on parole (95 per cent are men).[5]
12,000	*Estimated number of narcotic addicts* (80 per cent male).[6]
2,900,000	*Total conditions listed.*†

*This number represents conditions, not people, since one person can have several of the conditions listed.

†This number represents conditions, not people, since one person can have several of the conditions listed. It is not known how many of the above conditions are represented by licensed vehicle operators or what effect the conditions may have on ability to drive safely. However, it is not unlikely that 75 to 95 per cent of these conditions occur in licensed drivers. All but one of the conditions occur more often in men and 90 per cent of men are licensed (99 per cent between 25 and 65 years).

but the procedure can hardly be justified on a scientific basis as a panacea for traffic accident prevention. Before embarking on such extensive "shot-gun" therapy for all drivers it would be well to study first the relationship between traffic accidents and the medical characteristics of the drivers at fault. With this information, medical standards and medical examination techniques could be devised and focused upon whatever drivers and whatever medical conditions actually contribute to accidents. Barriers to such a study are the lack of practical and precise methods of measuring the tremendous variety of impairments of potential significance, and the lack of specifications for the driving task.[2]

Medical standards for drivers have been published and should be very useful to physicians advising their patients.[1,3] However, the authors of standards are careful to point out that their standards are based on expert opinion. These standards could be tested in the framework of a special study wherein a group of drivers are first examined medically and their driving experience followed to see to what degree the standards used are effective in selecting poor risks, and if the selection has been accomplished as efficiently as it would be by other methods.

In principle, drivers should be evaluated at intervals for their skill and fitness. However, there is a great deal of work and study ahead before the machinery to accomplish this objective can be established on a basis sufficiently sound to apply to all drivers. In the meantime, it would seem reasonable that individual drivers selected for one reason or another as poor risks should be examined medically. Indeed, this is often done in California. Special risk drivers, such as commercial and passenger vehicle drivers, are required to be examined periodically. Unfortunately, few studies have been carried out to determine the value of these examinations, the kind and extent of examination which is most profitable or the qualifications necessary for the examiner.

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